Tips for Writing a Technical Report

Or “How to Survive Writing your IED/Capstone Papers”

by: Mark Anderson

These tips are based on my review of papers submitted by students of the Introduction to Engineering Design with Professional Development 1 course and from my seniors taking Capstone Design. One might justifiably refer to them as an instructor’s “pet peeves”! These keep these tips in mind while also using the other various resources for proper technical writing.

1. Avoid marketing terminology. This is an engineering document and should use technical wording and phrasing.
2. Avoid excessive or exaggerated non-technical claims. A normal and perfectly acceptable IED-PD1 project outcome is a demonstrable working prototype that meets the requirements and specifications set for it. Generally speaking it is not directly “marketable” and it would not be reasonable to expect to see a copy of an IED project on store shelves. But – it does not have to! For Capstone projects, while the expected outcomes are clearly more substantial and detailed, they are still not typically directed at immediately marketable consumer products.
3. Ethics – if the design didn’t work, just say so. Don’t stretch the truth here! Engineers are accountable for their results. Report what actually happened and where it does and does not meet the requirements. You cannot generally alter the requirements to match what you were able to produce!
4. We currently use Microsoft Word for IED and prefer it for Capstone. Use its built-in features! These include automatic numbering and referencing of figures and tables and the ability to always generate properly formatted citations and lists of references! It also has spell-checking and grammar checking tools – use them!
5. Use technical terms rather than casual ones wherever possible. For example, rather than referring to a material as “strong” or “light” provide some numerical indication of its mechanical properties. Even more important is to explain why your design depends on those details. Often, these projects really do not depend on those details.
6. Leave out details that really don’t matter. If the dimensions of some of the parts are not critical to the actual design, don’t dwell on them! If a piece of wood was a particular size only because that was what was in the scrap bin, you don’t need to justify or explain that. DO show all dimensions on a sketch or drawing in case someone would like to repeat your design.
7. Please use sketches, whether hand drawn, CAD, or actual photos. Label each figure and refer to it in your report. Label key features within the figures and use those labels to describe them in the text. When including tables or figures always describe / refer to them in the text.
8. Avoid statements that have no backup data. Do not, for example, state that “numerous designs were considered” unless you include a table or sketches of those designs so that the reader actually knows what you considered. You should also them explain in technical terms why you selected the final design.
9. Read and understand any applicable rubrics before you start and again before you finish! Make sure you actually address everything it includes. You must critically proof read the entire document.
10. Avoid / minimize “flowery” writing, extra words, “fluff” and similar attempts to either pad the length of the report or make it less dry! The report should be as long as it needs to be to cover the topic at hand - unlike a high school English creating writing assignment. And, unlike most high school creative writing assignments, a technical report **should** be a little dry! It is intended to document and explain facts not tell a fictional story!
11. We suggest APA formatting guidelines for the references / citations. Although strict APA guidelines for the placement of figures indicates they should all be at the end of the paper it is much easier to read a paper when the relevant figure is placed in the text where you are describing it. This is the method typically used in your textbooks. Tables should be considered on a case by case basis to either go at the end or within the body of the document. If there is a large amount of data in tables, place those in the appendix and place a summary of that data in the body. Consider how easy it will be for the reader to understand what you are trying to explain. Do not simply place all tables in an appendix.
12. When documenting a chosen design, be sure to also cover the designs you did NOT select! Include sketches / tables / descriptions of the concepts you rejected and why you rejected those.
13. The IED class is about engineering design, not manufacturing. Focus on the engineering design and cover only those manufacturing / fabrication details that are essential to understanding its operation. The rest can usually be covered in one or two figures with labels and dimensions. For Capstone, the manufacturing / fabrication details may be a critical aspect of the overall design and thus may be included as appropriate.
14. For IED use the Final Report Template, available in the writing resources folder on LMS. For Capstone, see the Capstone Support wiki.
15. For IED, use the information in the Technical Writing activity.
16. For IED, be sure to submit your report as a single file in its original format. Microsoft Word is preferred although with instructor permission you may submit it in OpenOffice or .pdf format. If you have pictures, diagrams, charts, etc. be sure to place them within your document – do not submit them as separate files as they may get separated from your report. For Capstone, Word is preferred although specific projects may permit or require a different format – see your Project Engineer.
17. Be sure to include all author names, the section number and the instructor name on the cover page.
18. For IED, the filename for your submitted document must reflect the author names and the type of document. This helps your instructor keep the files properly sorted! An example of the acceptable file names for a Mini-Project report from authors Andrew Smith and Michael Jones would be:
    1. smith-jones-mini-project-report.docx (last names)
    2. smitha-jonesm-mini-project-report.docx (RCSIDs)
19. Remember the 5W’s and 2H’s when preparing your report. These are:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Who | What | When | Where | Why | How | How Much |

1. The IED lab activities help you create specific content for your report! Be sure to check all of the activities and include the required items. The course is specifically designed so that the work you do in the activities is directly relevant for your final report!